

41. (New) A mesostructure having a mesopores comprising:
a polymer compound surface containing a sequence of two or more
adjacent methylene groups in a molecular structure of the repeating unit of the polymer
compound; and
uniaxially oriented rod-shaped mesopores arranged on the polymer
compound surface.

REMARKS

The claims are 1-36 with claims 1, 23 and 41 being independent. Claim 23 has been amended to resolve an informality and to better define the intended invention.

Reconsideration of the claims is expressly requested.

Former claims 1-22 were withdrawn as non-elected. In the event of allowable subject matter Applicant requests rejoinder of claims 1-22 under M.P.E.P. §821.04. Accordingly, to facilitate rejoinder Applicant requests an opportunity to amend the method claims to be commensurate in scope with the product claims once allowable subject matter has been indicated.

Support for amended claim 23 is found, inter alia, on page 5, lines 9-14.

Support for claim 38 is found, inter alia, on page 13, lines 13 and 14.

Claims 23-36 were rejected under Rule 112, second paragraph, as being indefinite. To resolve that informality, claim 23 has been amended to change "rod-like" to --rod-shaped--. Withdrawal of the objection is respectfully requested.

Claims 23-30, 32, 33 and 35 were rejected as anticipated by Ozin '666. Claims 31, 34 and 36 were rejected as obvious over Ozin in view of either Itoh, Ward or Leung, respectively. The grounds of rejection are respectfully traversed.

Prior to addressing the grounds of rejection Applicant wishes to briefly review certain key features and advantages of the present claimed invention. As noted on specification page 8, it is important to uniaxially orient the pores of the mesostructured thin film. This provides the mesostructured thin film with good uniformity and continuity. Applicants has determined that the claimed polymer compound with a sequence of two or more adjacent methylene groups in the repeating unit will facilitate formation of a film having a mesostructured with excellent uniaxial orientation. To provide the uniaxial orientation of the rod-shaped porous structure, the claimed polymer compound can be rubbed or an LB film of the polymer can be utilized, among other possible embodiments.

Accordingly, it is a key feature of the present claimed invention that a mesostructured thin film having uniaxially oriented rod-shaped pores is formed on a polymer compound containing a specific sequence of two or more adjacent methylene groups which then facilitates proper uniaxial orientation for the pore structure.

The primary reference supplied, Ozin '666, merely teaches that a mesoporous silica structure is formed at an air-water interface (Example 1), and air-high density polyethylene interface (HDPE) (Example 2) or an air-water interface (Example 3). The reference does not teach that the formed mesostructure is uniaxially oriented. Accordingly, the anticipation rejection of claims 23-30, 32, 33 and 35 fails because the primary reference, Ozin, fails to teach that the mesostructured is uniaxially oriented.

For the purpose of the present invention it is insufficient merely to deposit a porous structure on any polyethylene surface. In one aspect, the surface of a polyethylene is rubbed in order to orient it uniaxially. Thereafter, the mesostructure is formed thereon. Ozin fails to teach anything about orienting a high density polyethylene surface when forming a microporous structure at its interface. There is no disclosure that the mesoporous structure of Ozin has a uniaxial orientation. The Examiner's attention is directed to the disclosures at columns 5 and 6 of Ozin which teaches a preference for a water-air interface or a water-water interface in order to form the mesoporous film.

In Example 2 of Ozin, a mixture is transferred to a high density polyethylene bottle. A film is then grown at the water-high density polyethylene interface. However, there is absolutely no teaching or suggestion that the polyethylene surface should be oriented by rubbing or the like.

Ozin clearly does not teach one of ordinary skill anything about how to form a uniaxially mesoporous structure. Ozin teaches nothing about how to rub high density polyethylene in order to provide any specific orientation of its surface. Hence, there is nothing in Ozin to teach that the high density polyethylene in Ozin should be considered to be oriented in any specific axial direction. Clearly, one of ordinary skill understands that orientation of polymeric compounds can vary dependent on surface treatment and manufacturing conditions.

The defects and deficiencies of Ozin are not remedied by the secondary references. Neither Itoh or Leung teach that the orientation of the substrate surface on which a film was formed must be considered when forming a uniaxially orient porous structure.

Ward merely teaches a process for forming a high density polyethylene polymer which is oriented. No mesostructure is formed on the polymer. Ward, in column 2, lines 55-58, teaches that molecular orientation in his polymer is usually uniaxial, although it is possible to produce biaxially oriented polymer materials. Ward teaches that in order to produce an oriented polymer material one must take into account the rate of cooling of the polymer to a specific cooling temperature and the drawing of a polymer at a temperature and rate to provide a specific deformation ratio of at least 15.

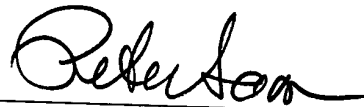
Based on Ward, one of ordinary skill would understand that absent any specific disclosure about the type of polyethylene employed, that various types of polyethylene can be utilized including non-oriented, partially-oriented, uniaxially-oriented or biaxially-oriented. Clearly, Ward provides no teaching that in order to provide a uniaxially oriented rod-shaped porous structure, one should utilized a specific polymer compound which should be specifically oriented.

There is no suggestion to combine the Ward disclosure of oriented HDPE with Ozin. Ward teaches that a number of steps must be followed to form an axially oriented polyethylene. If the steps are not precisely followed, then biaxially oriented or a partially oriented product could result. Neither Ward nor Ozin teaches that the mesostructure should be specifically oriented. Ward does not teach or suggest that orienting HDPE will orient a mesostructure.

Accordingly, none of the references, whether considered alone or in combination, discloses or suggests the present claimed invention nor renders it unpatentable.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIM 23

--23. (Amended) A mesostructured thin film having an uniaxially oriented [rod-like] rod-shaped pore structure formed on a polymer compound, the polymer compound containing a sequence of two or more adjacent methylene groups in a molecular structure of the repeating unit of the polymer compound.--